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H-1210

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: N. MATSUNAMI, et al

Serial No.: 10/775,886

Filed: February 10, 2004

For: STORAGE DEVICE

RENEWED REQUEST FOR RECONSIDERATION OF PETITION TO MAKE SPECIAL UNDER 37 CFR 1.102(d) and MPEP. §708.02, VIII

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

June 28, 2005

Sir:

The present Renewed Request for Reconsideration is being filed on even date with a Preliminary Amendment for the present application that amends the claims so as to clarify the features of the present invention. Even though the claims are being amended it should be noted that the original search applies as well to the amended claims since the amended claims still retain the same salient features of the invention as originally searched. Accordingly, the present Renewed Request for Reconsideration distinguishes the claimed features of the amended claims from the same references deemed most closely related as identified in the April 1, 2005 Petition these same references apply as well to the claimed features of the amended claims.

1. Petition

Applicants hereby renews its Petition to make this application **Special** previously submitted on April 1, 2005, in accordance with 37 CFR §1.102(d)

and MPEP 708.02, VIII. The April 1, 2005 Petition was denied by a Decision issued on April 28, 2005 in which the Petitions Examiner stated that the April 1, 2005 Petition failed to recite distinct features of the claimed subject matter. The present Request for Reconsideration of Petition incorporates by reference the April 1, 2005 Petition and provides additional details regarding the claims and how the claimed subject matter is patentable over the references. The present invention is a new application filed in the United States Patent and Trademark Office on February 10, 2004 and as such has not received any examination by the Examiner.

(A) This Petition is accompanied by the fee set forth in 37 CFR §1.17(h).

The Commissioner is hereby authorized to charge any additional payment due, or to credit any overpayment, to Deposit Account No. 50-1417.

(B) All claims are directed to a single invention.

If the Office determines that all claims are not directed to a single invention, Applicant will make an election without traverse as a prerequisite to the grant of special status in conformity with established telephone restriction practice.

(C) A pre-examination search has been conducted.

The subject matter of the above-identified application relates to a network storage system having multiple types of disks, and the hierarchical storage control thereof. According to one embodiment of present invention, a storage system that is connected to at least one computer is provided. The

storage system includes a first interface control device that receives from the at least one computer an access request designating identification information of a file. A second interface control device connecting to the first interface control device is provided. A plurality of disks connecting to the second interface control device are provided. The plurality of disks include at least one first disk, and at least one second disk, the first disk and the second disk are of different kinds. The first interface control device decides based on identification information received from the computer a storage position of data of the file designated by the identification information within the plurality of disks. The second interface control device controls to store the data of the file designated by the identification information at the storage position decided by the first interface control device.

To determine the patentability of the claims as submitted in the application, a thorough and careful search was conducted in the United States Patent and Trademark Office in Class 707, subclass 205; Class 711, subclasses 112-114, 117-118, 147, 151, and 170; and Class 714, subclasses 7. This search was conducted by Iuliana Tanase, an associate at the firm of Lacasse & Associates, L.L.C.

(D) The following is a list of the references deemed most closely related to the subject matter encompassed by the claims:

U.S. Patent No.	Inventors
6,275,898	DeKoning

U.S. Patent Application Publication No.	Inventor(s)

2001/0054133	Murotani et al
2004/0044854	Gibble et al
2004/0098394	Merritt et al

A copy of each of these references (as well as other references uncovered during the search) was enclosed with the April 1, 2005 IDS.

(E) It is submitted that the present invention is patentable over the references for the following reasons.

It is submitted that the cited references, whether taken individually or in combination with each other, fail to teach or suggest the invention as claimed. In particular, the cited references, at a minimum, fail to teach or suggest in combination with the other limitations recited in the claims:

a first feature of the present invention as recited in independent claim 1 wherein (1) the first disk and the second disk have different kinds of interfaces and (2) a first interface control device decides based on identification information of a file received from the computer a storage position of data of the file designated by the identification information within the plurality of disks;

a second feature of the present invention as recited in independent claim 8 wherein (1) the first disks and the second disks have different kinds of interfaces and (2) a first interface control device, upon receiving an access request from the computer, decides, according to property of a file designated by the identification information contained in the access request received, as to which one of the first storage region and the second storage region to store data of the file;

a third feature of the present invention as recited in independent claim

15 wherein (1) the first disks and the second disks have different kinds of interfaces and (2) a first interface control device, upon receiving an access request for a file from the computer, decides as to which one of the first storage region and the second storage region to store data of the file according to property of the file indicated by identification information contained in the access requested received;

a fourth feature of the present invention as recited in independent claim 20 wherein (1) at least one of the first, second and third disks has an interface which is different from the interfaces of the other disks and (2) a first node controls to store data of the file in one of the first storage region, the second storage region and the third storage region according to property of the file specified by identification information received from the computer; and

a fifth feature of the present invention as recited in independent claim 25 wherein (1) at least one of the disks of one disk pool has an interface different from the interfaces of disks of another disk pool and (2) a file I/O interface control device migrates at least one of the files from one of the LUs to another one of the LUs of an optimal storage class, based on static properties and dynamic properties of each file.

To the extent applicable to the present Petition, Applicants submit that although the distinguishing feature(s) may represent a substantial portion of the claimed invention, the claimed invention including said feature(s) and their inter-operation provides a novel storage system and system and method related to or implemented in or by said storage system not taught or suggested by any of the references of record.

The differences between the features of the present invention as recited in the claims and the references considered most closely related to the claimed invention are discussed below:

The present invention as recited in each of the independent claims is directed to a storage system having multiple types of storage device connecting to one or more interface control devices. DeKoning does not teach or suggest a storage system having storage medium of different types. Moreover, DeKoning fails to teach or disclose the limitation, "first interface control device decides, based on identification information received from the computer or properties of the file identified by the identification information, a storage position of data of the file designated by the identification information within the plurality of disks," and "a file I/O interface control device migrates at least one of the files from one of the LUs to another one of the LUs of an optimal storage class, based on static properties and dynamic properties of each file" as required by the present invention as recited in the claims.

In fact since DeKoning does not teach or suggest a storage system having storage medium of different types, there is no need for DeKoning to define different types of processings dependent on the different types of storage mediums and files as in the present invention. According to DeKoning, the storage controller having a performance monitor which includes a performance monitor and a storage utilization monitor. The storage controller migrates the partitions in LUN based on the performance monitor. (See, DeKoning; Col. 8, line 64 - Col. 9, line 39). Accordingly, DeKoning cannot anticipate nor render obvious the features of the present

invention as recited in each of the independent claims.

Therefore, DeKoning does not teach or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 8, the above described third feature of the present invention as recited in independent claim 15, the above described fourth feature of the present invention as recited in independent claim 20, and the above described fifth feature of the present invention as recited in independent claim 25, in combination with the other limitations recited in each of the independent claims.

Murotani does not teach or suggest a storage system having storage medium of different types. Moreover, Murotani fails to teach or disclose the limitation, "first interface control device decides, based on identification information received from the computer or properties of the file identified by the identification information, a storage position of data of the file designated by the identification information within the plurality of disks," and "a file I/O interface control device migrates at least one of the files from one of the LUs to another one of the LUs of an optimal storage class, based on static properties and dynamic properties of each file" as required by independent claims. According to Murotani, an external performance manager is provided in a storage system. (*See, Murotani; [0011]*). The external manager gathers activity rate of each physical drive constituting logical volumes, the activity rate of the logical volumes, the access patterns, the performance information and the configuration information of the correlation between the physical

drives and the logical volumes. And the external manager generates a data migration instruction by using the accumulated information and input application priority conditions and priority period, and issues an instruction to the controller of a storage system. (*See Murotani; [0011], [0012], [0027]-[0030]*). Accordingly, Murotani cannot anticipate nor render obvious the features of the present invention as recited in each of the independent claims.

Therefore, Murotani does not teach or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 8, the above described third feature of the present invention as recited in independent claim 15, the above described fourth feature of the present invention as recited in independent claim 20, and the above described fifth feature of the present invention as recited in independent claim 25, in combination with the other limitations recited in each of the independent claims.

Gibble discloses a storage system having multiple types of storage element connected hierarchically. (*See, Gibble; Figure 2; Page 2, Para. 0024-0025*). However, Gibble does not disclose a plurality of disks having different kinds of interfaces, and also Gibble fails to teach or disclose the limitation, "first interface control device decides, based on identification information received from the computer or properties of the identified file, a storage position of data of the file designated by the identification information within the plurality of disks," and "a file I/O interface control device migrates at least one of the files from one of the LUs to another one of the LUs of an optimal

storage class, based on static properties and dynamic properties of each file" as required by the present invention as recited in the claims. Gibble discloses a centralized storage server. (*See, Gibble; Figures 1 and 2*). The server stores pool information including a pool threshold level and a target tool. In Gibble, when a storage device within a pool is selected, a determination is made whether the selected device has exceeded the pool threshold level stored in the server. (*See, Gibble, Abstract; Page 1, Para. 0009*). Accordingly, Gibble cannot anticipate nor render obvious the features of the present invention as recited in each of the independent claims.

Therefore, Gibble does not teach or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 8, the above described third feature of the present invention as recited in independent claim 15, the above described fourth feature of the present invention as recited in independent claim 20, and the above described fifth feature of the present invention as recited in independent claim 25, in combination with the other limitations recited in each of the independent claims.

Merritt discloses a storage device that can be a device including one or more storage mediums. (*See, Merritt; Page 3, Para. 0041*). However Merritt teaches a software storage controller disposed between the virtual file system and a file system within an operation system. (*See, Merritt; Page 3, Para. 0042-0043; Figure 1*). There is no teaching in Merritt that the storage systeme can have a plurality of disks having different kinds of interfaces. Moreover,

Merritt does not teach or suggest "a first interface control device that receives from the at least one computer an access request designating identification information of a file and decides, based on identification information received from the computer or properties of the identified file, a storage position of data of the file designated by the identification information within the plurality of disks" and "a file I/O interface control device migrates at least one of the files from one of the LUs to another one of the LUs of an optimal storage class, based on static properties and dynamic properties of each file" as required by the present invention as recited in the claims. Accordingly, Merritt cannot anticipate nor render obvious the features of the present invention as recited in each of the independent claims.

Therefore, Merritt does not teach or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 8, the above described third feature of the present invention as recited in independent claim 15, the above described fourth feature of the present invention as recited in independent claim 20, and the above described fifth feature of the present invention as recited in independent claim 25, in combination with the other limitations recited in each of the independent claims..

Therefore, since the cited references fail to teach or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 8, the above described third feature of the present

invention as recited in independent claim 15, the above described fourth feature of the present invention as recited in independent claim 20, and the above described fifth feature of the present invention as recited in independent claim 25 in combination with the other limitations recited in each of the independent claims, it is submitted that all of the claims are patentable over the cited references whether said references are taken individually or in combination with each other.

The remaining claims depend either directly or indirectly from independent claims 1, 8, 15, 20, and 25 and recite additional features and steps of the invention which are neither disclosed nor fairly suggested by the cited references and are therefore also believed to be in condition for allowance.

(F) Conclusion

Applicant has conducted what it believes to be a reasonable search, but makes no representation that "better" or more relevant prior art does not exist. The United States Patent and Trademark Office is urged to conduct its own complete search of the prior art, and to thoroughly examine this application in view of the prior art cited herein and any other prior art that the United States Patent and Trademark Office may locate in its own independent search. Further, while Applicant has identified in good faith certain portions of each of the references listed herein in order to provide the requisite detailed discussion of how the claimed subject matter is patentable over the references, the United States Patent and Trademark Office should not limit its review to the identified portions but rather, is urged to review and consider the

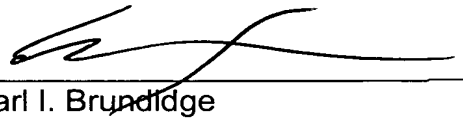
entirety of each reference, and not to rely solely on the identified portions when examining this application.

In view of the foregoing, Applicant requests that this Petition to Make Special be granted and that the application undergo the accelerated examination procedure set forth in MPEP 708.02 VIII.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (H-1210).

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.



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